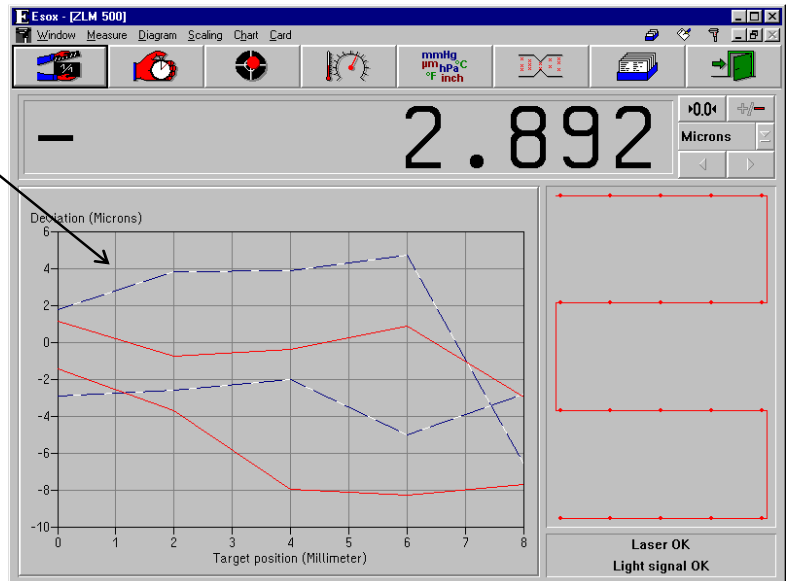


G 2.6 Analysis of a measurement

For analysing the measurements you can select between the diagrams and parameters according to the standard applied. Also available are tabulated measurement data.

After completion of a successful measurement, the bottom left portion of the screen shows a large diagram which constitutes a button.

A click on this button, or selection of the "Diagram" item in the "Diagram" menu, opens the analysis mode window.



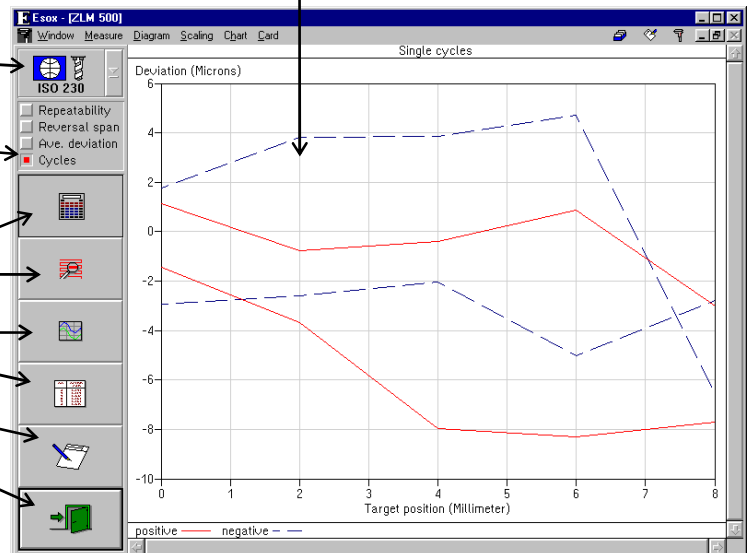
G 2.6.1 Controls for diagram handling


After calling a diagram the measurement program window is completely changed. Most of the screen area is now occupied by a diagram.

Use the drop-down list box to select the standard applicable.

In the box below this, you can select the type of diagram to be displayed.

- The buttons below this are intended for
- Displaying the parameters
- Selection of the measured data to be included in the analysis
- Autoscaling
- Opening a table of measured data
- Compilation of a record
- Quitting the diagram presentation



To move from one button to the next, press the  key.

In addition to these controls, you can also use some submenu items of the "Diagram", "Scaling" and "Table" main menus.

G 2.6.2 Selection of standard and type of diagram

The standard applicable to the analysis of the measurements can be selected at several stages of the program:

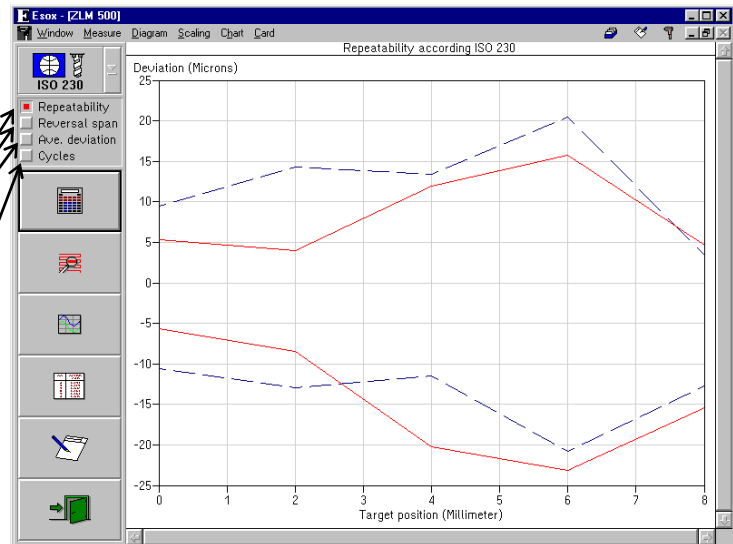
1. During preparation for measurement, in the "Parameters" dialog box.
2. By selecting the menu items "**Diagram-ISO 230**", "**Diagram-VDI 3441**", "**Diagram-VDI 2617**" and "**Diagram-NMTBA**".
3. In the drop-down list box during diagram presentation.

A change made in any of these ways will act on the entire program. Even if data of earlier measurements are read in, they will first be presented in accordance with the standard currently active.

While the standards "VDI/DGQ 3441", "VDI/VDE 2617" and "NMTBA" provide only one diagram each for analysis, the "ISO 239" standard lets you choose between three diagrams.

Use these buttons to select which diagram you want to be shown.

A click on the last of these buttons produces the numerical indication of the individual readings. This is possible with each of the standards selected.




Selection between diagram types can also be made with the following items in the "**Diagram**" menu:

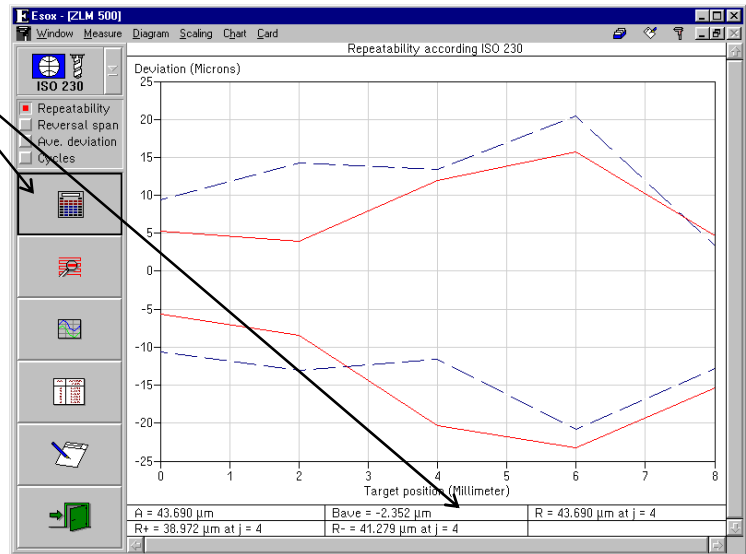
- "**Position uncertainty**" (not with ISO 230)
- "**Repeatability**" (with ISO 230 only)
- "**Backlash**" (with ISO 230 only)
- "**Average deviation**" (with ISO 230 only)
- "**Cycles**"

See section G 1.3 - "Standard analysis procedures" for an explanation of the curves shown in the diagrams, and the equations for their calculation.

G 2.6.3 Parameters

By clicking the  button you can display the parameters below the diagram. The button will lock. Click it again to remove the parameter display.

Parameter display can also be activated by selecting the **"Parameters"** item in the **"Diagram"** menu.




The symbols stand for the following parameters:

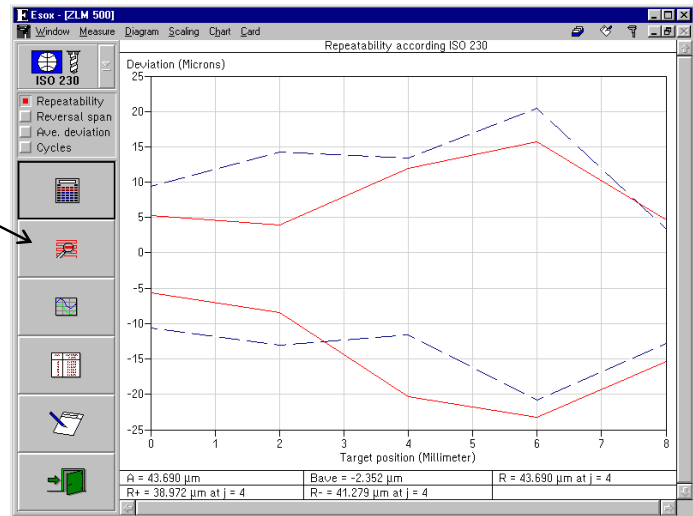
VDI / DGQ 3441 and VDI / VDE 2617	P Pa Bmax Bave Psmax Psave	Position uncertainty Position deviation Maximum reversal span (backlash) Average reversal span (backlash) Maximum position spread Average position spread
ISO 230	A Bave R R+ R-	Position uncertainty (Accuracy) Average backlash Maximum position spread (Repeatability) Maximum position spread (Repeatability), positive travel direction Maximum position spread (Repeatability), negative travel direction
NMTBA	P Pa Psmax Psave O	Position uncertainty Position deviation Maximum position spread Average position spread Offset

See section G 1.3 "Standard analysis procedures" for the equations for computing the parameters.

G 2.6.4 Selection of the measured data to be included in the analysis

If you want to analyse a partial range rather than all of the data measured,

click the  button or activate the **"Select positions/Cycles"** item in the **"Diagram"** menu to open a selection dialog.



The **"Selection of measured values"** dialog box permits you to enter the numbers of the first and the last of the cycles you want to include in the analysis. The n-th cycle means all data measured with the respective position travelled to for the n-th time from the positive direction, or for the n-th time from the negative direction.

After you change the default settings in the "Start position number" and "End position number" boxes, the analysis will only include the data measured at positions whose numbers lie between the selected limits.

In bidirectional measurements, the data measured in one of the two travel directions can be excluded from the analysis.

G 2.6.5 Zooming and scrolling of the visible diagram segment

For zooming the diagram segment shown on the screen you can use either the mouse or the keyboard.



Move the mouse cursor to a corner of the section of the diagram you want to magnify. Press the left mouse button and keep it depressed. Move the mouse until the movable frame encloses the diagram section of interest. Release the mouse button.

After pressing the **right mouse button** the full diagram is displayed again.

	Expansion by factor 2	Contraction by factor 2
horizontally		
vertically		

Use the scroll bars on the right and at the bottom of the window to shift the visible diagram portion. The slider boxes in the scroll bars indicate the location of the visible portion within the diagram.

To scroll up by 10%.

To scroll up by one windowful.

To scroll to any desired position vertically:
Click and hold the left mouse button. Drag the mouse until the square is in the wanted position.

To scroll down by one windowful.

To scroll down by 10%.

To scroll to the left by 10%.

To scroll to the left by one windowful.

To scroll to any desired position horizontally:
Click and hold the left mouse button. Drag the mouse until the square is in the wanted position.

To scroll to the right by one windowful.

To scroll to the right by 10%.

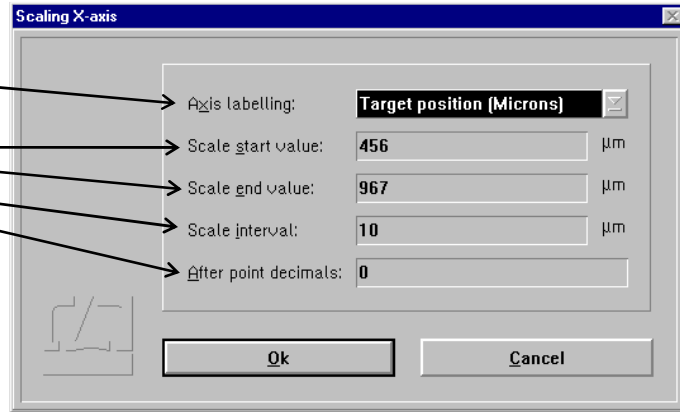
Scrolling	to the right	to the left	up	down
by 10%				
by one windowful				

G 2.6.6 Rescaling the diagram axes

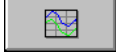
When the diagram presentation is started, the program automatically scales the diagram axes. If you want to change the unit of measurement or the coordinate scales, use the options "**Scaling abscissa**" or "**Scaling ordinate**" in the "**Scaling**" menu. Such a change will only remain valid until the visible diagram segment is changed by zooming or scrolling.

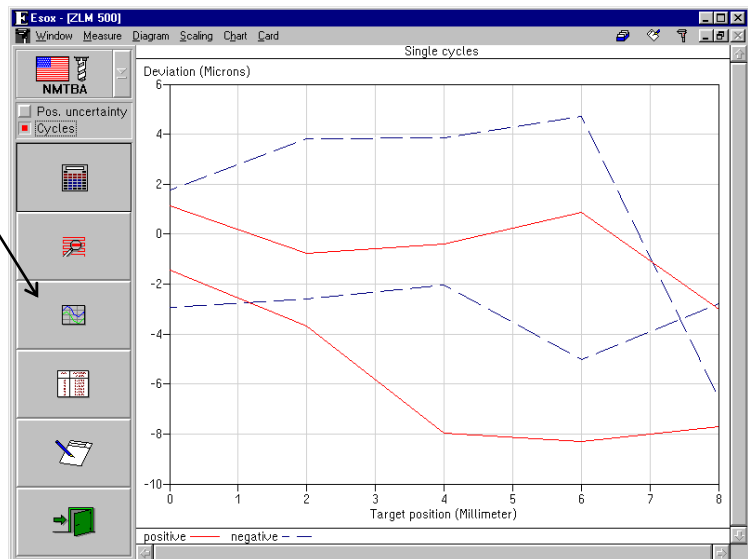
The list box "**Axis labelling**" can be opened to change the unit.

In the four input boxes below this you can specify the required scaling.

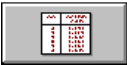


Automatic scaling (scaling same as when the diagram presentation is started) can be released

- with the  button,
- with the "**Autoscaling**" item of the "**Scaling**" menu, or
- by clicking the right mouse key on the diagram.



G 2.6.7 Tables

By clicking the  button while a diagram is displayed, a table with the measured data can be displayed in addition. The clicked button will lock. Click it again to remove the table.

Position uncertainty according NMTBA

Position Nr.	Target position (Millimeter)	Mean deviation (Microns)	Upper limit (Microns)	Lower limit (Microns)
1	0.000000	-0.372	6.249	-6.993
2	2.000000	-0.801	9.149	-10.751
3	4.000000	-1.632	13.070	-16.334
4	6.000000	-1.936	15.577	-19.448

P = 35.025 μm P_{max} = 35.025 μm O = 1.936 μm
 Pa = 4.651 μm P_{save} = 22.518 μm

Button for **maximizing** the table
 Scroll bars for shifting the visible portion of the table

Click these buttons to select the unit of measurement.

Click these buttons to select the number of decimal places.

The table may occupy either the bottom right portion (normal size) or the entire right portion (maximum size) of the program window. In the second case, the diagram is hidden behind the table. For switching between normal-size and maximized presentation of the table, click the button at the top of the right table margin.

The functions described above are accessible with the keyboard as well, if you select, in the **"Table"** menu, the options


- ### **"No table",**
- ### **"Small table" or**
- ### **"Big table"**

Position Nr.	Target position (Millimeter)	Mean deviation (Microns)	Upper limit (Microns)	Lower limit (Microns)
1	0.000000	-0.372	6.249	-6.993
2	2.000000	-0.801	9.149	-10.751
3	4.000000	-1.632	13.070	-16.334
4	6.000000	-1.936	15.577	-19.448
5	8.000000	-5.023	2.466	-12.532

Button for switching back to normal-size presentation of the table

G 2.6.8 Compiling a record (document)

The **"Document"** part of the program serves for printing the record and for compiling the record contents. It is there that the arranging of the record contents and the printing of the record are carried out, rather than in the measuring program. Diagrams, tables and statistical data can be transferred from the measuring program to the "Document" program module. For further information on the "Document" program module, see section L - Program module "Document"

Click the  button or call the **"Prepare document"** option of the **"Diagram"** menu to display the "Prepare document" dialog box.

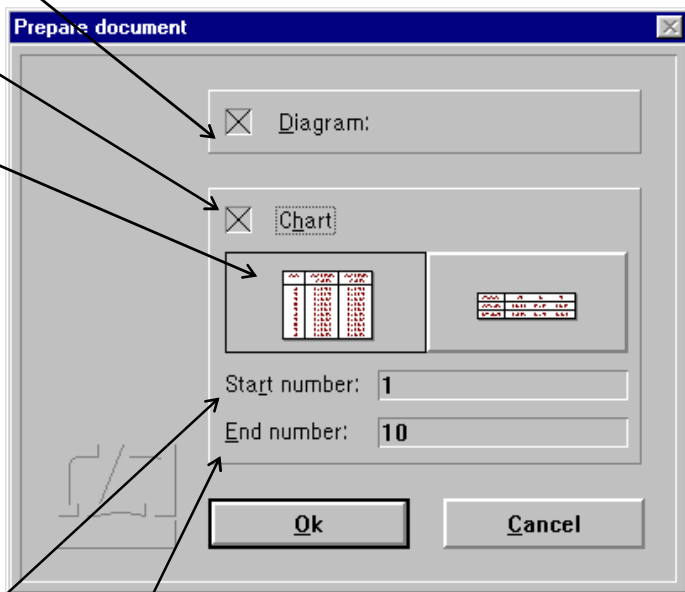
If the **"Diagram"** switch is activated (), the diagram displayed on the screen immediately before the "Prepare document" dialog box was called is transferred to the "Document" program module.

If the "Table" switch is activated, the buttons



can be clicked to select between horizontal and vertical arrangement of measured data in the table.

In case of horizontal arrangement, the table is split up and transferred to the "Document" program module in the form of several tables if all the measured data do not fit into one line. When recording a table, please mind that a printed text page has about 60 lines. If a great number of readings have been taken, you should select which of them to be transferred into a table.



For this you can use the "Start number" and "End number" input boxes.

If the number of measured data between the first and last readings entered exceeds 1000, the program will restrict the table to 1000 readings.

G 2.6.9 Exiting the diagram presentation

To exit the diagram presentation,

activate the  button or

choose the **"End diagram"** option of the **"Diagram"** menu.

